AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A method for discriminating between desired and undesired radiation events detected by a radiation detector in an imaging operation, comprising the steps of:

(a) obtaining a response function of said detector for a uniform field of radiation under conditions simulating an actual imaging operation;

(b) obtaining a radiation distribution of substantially an entire energy spectrum of radiation emanating from an object undergoing imaging in an actual imaging operation; and

(c) obtaining said desired radiation events by mathematically operating on said radiation distribution with said response function.

2. (Original) The method of claim 1 wherein the detector is used in a medical imaging device.

3. (Original) The method of claim 1 wherein the detector is a pixelated, cadmium zinc telluride (CZT) device.

4. (Original) The method of claim 3 wherein the step of obtaining a response function comprises obtaining a response function for each pixel of the CZT detector.

5. (Original) The method of claim 1 wherein the step of obtaining desired radiation events includes the steps of forming a least squares estimate of the number of desired events by taking a dot product of the energy response function for the actual imaging operation and a weighting vector determined during the step of obtaining a response function for a uniform radiation.

6. (New) A method for discriminating between desired and undesired radiation events detected by a radiation detector in an imaging operation, comprising the steps of:

(a) obtaining a response function of said detector for a uniform field of radiation under conditions simulating an actual imaging operation;

(b) obtaining a radiation distribution of substantially an entire energy spectrum of radiation emanating from an object undergoing imaging in an actual imaging operation; and

(c) obtaining said desired radiation events by mathematically operating on said radiation distribution with said response function to form a least squares estimate of the number of desired events by taking a dot product of the energy response function for the actual imaging operation and a weighting vector determined during the step of obtaining a response function for a uniform radiation.

7. (New) The method of claim 6 wherein the detector is used in a medical imaging device.

8. (New) The method of claim 6 wherein the detector is a pixelated, cadmium zinc telluride (CZT) device.

9. (New) The method of claim 6 wherein the step of obtaining a response function comprises obtaining a response function for each pixel of the CZT detector.

10. (New) A method for obtaining unscattered radiation events from a radiation distribution of radiation emanating from an object as detected by a radiation detector, comprising the steps of:

obtaining a response function of said radiation detector to a uniform field of radiation without using any energy window discrimination of radiation events;

obtaining an energy spectrum of scattered and unscattered events created by radiation from said object without using any energy window discrimination of radiation events; and

mathematically operating on said energy spectrum with said response function to thereby obtain a distribution of unscattered events created by radiation from said object.